Design of a High Capacity Load Cell for Neutron Diffraction Stress Analysis: A SURF Student Project

Alan Thrift, UNC Charlotte, and T. Gnaüpel-Herold, NCNR - DMR-9986442

Alan Thrift, a junior majoring in mechanical engineering at UNC Charlotte, completed an engineering design project during his CHRNS sponsored summer (2004) internship at the NCNR. Working under the guidance of the NCNR's Dr. Thomas Gnaüpel-Herold, Alan produced a compact design capable of delivering 15 tons of force to a sample in tension or compression. Alan's load cell allows neutron diffraction measurements to be made over a wide range of angles, a critical feature of the design.

Alan not only modeled his design, he produced a complete set of fabrication drawings, parts lists, and operating instructions. His design is being fabricated and will become a piece of standard apparatus in the NCNR's stress analysis program.

Student Alan Thrift (left) with advisor, Dr. Thomas Gnaüpel-Herold